97 Chevy S10E computer hack?

1 - 11 of 11 Posts

B **bjnkm2** · Registered
Joined Dec 28, 2016 · 13 Posts

Discussion Starter · #1 · Mar 19, 2018

I have a 1997 Chevy S10E, (GM built, not a conversion). It was designed with the Panasonic Lead Acids but I'd like to go with Lithium. There are several issues that I have to deal with.
1. The Battery Pack Control Module, (BPCM), Has to see "12" volt signals from all 26 batteries in series. (About 353 volts fully charged). So I can't just assemble a 353 volt lithium pack to replace them.
I do OK with mechanical and electrical issues but I need to know if anyone out there can get into this computer, (The BPCM), and modify or eliminate the 12 volt signal requirements? Similar to "Flashing" a computer in a car to change performance.
This truck, produced in 97 and 98, had Lead Acids and Nickle Metal batteries which require different charging algorithms. There is a program available to flash between the 2 packs using a laptop and the a Tech 2 analyzer, which I have, so I'm thinking it's possible.
My next problem would be charging. But one issue at a time.
Thanks,
Kevin
Bear, Delaware

P **piotrsko** · Registered
Joined Dec 9, 2007 · 1,560 Posts

#2 · Mar 20, 2018

How about every 3-4 cells you provide a lead out to the control module using 30 gauge?

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A **abmcomp** · Registered
Joined Aug 18, 2008 · 9 Posts

#3 · Mar 20, 2018

I used a 97 S10e powertrain in the front of a hybrid pontiac fiero project once using prius batteries instead of the stock battery. I created a network of 26 high value resistors to generate 26 equal voltages for the BPM to be happy. Similar trick with resistors to fake temperature sensor inputs.

Now i have a 98 s10e that I'm retrofitting a G1 Volt battery and charging system into. No plans to keep the BPM this time, I'll use an Arduino to replace the BPM's few vehicle facing functions.

Nice to see other people are still working on these. What are your full plans with your truck? That may help give better advice.

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B **bjnkm2** · Registered
Joined Dec 28, 2016 · 13 Posts

Discussion Starter · #4 · Mar 20, 2018

> abmcomp said:
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>
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> time, I'll use an Arduino to replace the BPM's few vehicle facing functions.

My plans keep changing. I would love to keep this truck on the road but I've spent a lot of money doing it already. Mostly on batteries. I think an Electric truck just makes sense. My 1st pack were 12AVR75 from Deka. They held up ok. My current pack is EV34A-A from Discover. They are absolute junk from China. Range on a new pack should be 60 miles. It never went more than 20 miles. After 1 year and 1800 miles I can't go over 5 miles without a "Bat Life" light. I suspect the quality control for balanced cell production is non-existent in China for lead acids.
When you did the Fiero, I'm assuming you meant to say you took the FWD system from the truck and installed it in the back of the Fiero?
I'm a big fan of Fiero's. I've owned at least 6, including one of the first in 1984. I even did a 305 TPI V-8 in an 88. One of my other cars is a GT-40 kit on a Fiero chassis.
I have all of the service manuals and I went through every page of the computer controls. My thought was to simply remove or bypass the BPCM but the (PIM), controller requires serial data from it and the electric power steering gets it's 3 phase power through the PIM and is variable by speed. I would like to keep the truck as close to original as possible. If the BPCM could be re-programmed to accept the lithium pack, I'd be happy.
As a last resort, I could remove all of the controls, power steering, BPCM and go with a different controller and charger. Again, a lot more money.

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B **bjnkm2** · Registered
Joined Dec 28, 2016 · 13 Posts

Discussion Starter · #5 · Mar 20, 2018

> piotrsko said:
> How about every 3-4 cells you provide a lead out to the control module using 30 gauge?

I would produce 26 Lithium modules to replace the lead acids, so the 12 volt signal would be the easy part.
If I used these,
https://www.ebay.com/itm/NEW-Box-of...482937?hash=item2cb3588139:g:vj0AAOSwUYNaAcNp
I would assemble 32 in parallel then stack 4 of these in series producing a 105.6 AH 12.8 volt module. (That's a total of 3,328 cells. At $1.00 each, cheaper than a new lead acid pack and much better performance with 1/3rd the weight). The problems start with putting 26 of these modules in series. The BPCM, which plays the part of a BMS, is designed around lead acids. To balance the lead acids, the BPCM can send over 410 volts to the pack, almost 16 volts to each battery, or in my case, Lithium module. That would be 4 volts to each parallel layer. Anything over 3.3 volts could cause a fire hazard. I may be able to limit charging voltage going in to each layer to 3.3 volts but it may also limit the current that I could

draw from the pack. Does a current limiting circuit of 3.3 volts/ 105 amps exist? I would need 104 of them.

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A **abmcomp** · Registered
Joined Aug 18, 2008 · 9 Posts

#6 · Mar 20, 2018

So thats one reason i went with the Volt battery. The voltage window better aligns between the battery and the inverter with this combination.

Seems like you might be better pushing the voltage range of your pack higher to match the s10 hardware. What will monitoring these cells with the S10 BPM gain you?

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B **bjnkm2** · Registered
Joined Dec 28, 2016 · 13 Posts

Discussion Starter · #7 · Mar 20, 2018

> abmcomp said:
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>
> Seems like you might be better pushing the voltage range of your pack higher to match the s10 hardware. What will monitoring these cells with the S10 BPM gain you?

The gain would be keeping my gauges functional. Speed, SOC, Pack voltage, and monitoring of each Battery or module. It would also be nice to use the paddle charger system. All of which runs through the PIM and BPCM.

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A **aeroscott** · Registered
Joined Jan 5, 2008 · 1,466 Posts

#8 · Mar 20, 2018

I have a same problem , a ford ranger 1998 factory ev , 8 volt LA battery pack . Would like to use the G1

volt pack too. I have the factory manuals.
I wounder what air conditioner/ controller was used on the chevy and the ford, maybe the same. I was thinking of using it on my boat since the ford is just sitting in storage.

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B **bjnkm2** · Registered
Joined Dec 28, 2016 · 13 Posts

Discussion Starter · #9 · Mar 20, 2018

> aeroscott said:
> I have a same problem , a ford ranger 1998 factory ev , 8 volt LA battery pack . Would like to use the G1 volt pack too. I have the factory manuals.
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The A/C in the 97 S10E is a heat pump. Works great in A/C mode but only down to 43 degrees for heat. Below 43 a diesel fueled boiler fires up and heats coolant for a standard heater core. I switched to Kerosene. Thick black Diesel smoke coming out of my "100%" electric truck just didn't look right. The system also heats or cools the entire battery pack for efficient use and charging.

With 8 volt batteries, you could use the 18650's. (3.7 volts nominal, 4.2 volts max). 2 in series would get you to 7.4 nominal and would have to be limited to 8.4 volts max during charging. You would have to parallel enough to get to the proper max amp draw for your truck. I believe the drive system in your Ford is a Siemens motor. Completely different than the GM.

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A **abmcomp** · Registered
Joined Aug 18, 2008 · 9 Posts

#10 · Mar 20, 2018

> bjnkm2 said:
> The gain would be keeping my gauges functional. Speed, SOC, Pack voltage, and monitoring of each Battery or module. It would also be nice to use the paddle charger system. All of which runs through the PIM and BPCM.

Speed and pack voltage is sourced from the PIM underhood and should still work on the 97.

SOC gauge is driven by the PIM, but the signal is calculated by the BPM. With a big chemistry change I have no confidence that this would work even if you kept the BPM monitoring every few cells.

The paddle charger is neat, but its a dead standard. I see J1772 as a must for anything that I would want to drive.

Your comment about monitoring module voltages - this would be redundant to cell monitoring from your new BMS right? and if so why bother?

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A **aeroscott** · Registered
Joined Jan 5, 2008 · 1,466 Posts

#11 · Mar 21, 2018 (Edited)

> bjnkm2 said:
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Great system for cold climets , I have a military heater ,24 volt , water exchanger runs on diesel or kerosene .
For water pump mercedes use a 12 volt heater pump that on 1990 and up is magnetically coupled (no shaft seal) , 3 amps 5gpm.
This is to supply the heater at low rpm's when the main pump is to slow. Don't know if it can take 100% duty cycle.

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